# ABSTRACT OF THE DISCLOSURE

A device has a source for emitting near infrared radiation into cerebral tissue, a sensor for detecting radiation exiting from the tissue, and an evaluation unit which detects the exiting radiation as an input signal having pulsatile and non-pulsatile components and is programmed to determine the concentration of an injected indicator in the tissue from the non-pulsatile signal component, iteratively determine an inflow function characterizing cerebral blood flow by varying a mean transit time until reaching a stop criterion, determine indicator concentration relative to cerebral blood volume from the inflow function and the pulsatile signal component, calculate cerebral blood volume by dividing indicator concentration in the tissue by indicator concentration relative to cerebral blood volume, calculate cerebral blood flow by dividing the cerebral blood volume by the mean transit time when the stop criterion has been reached, and scale the inflow function using values determined from the pulsatile signal component.